

CLAIMS:

- Sub B1
1. A substantially solid biomolecular solder comprising biomolecules which are denatured so that in use, the solubility of the solder is reduced.
- 5 2. A solder according to claim 1 wherein the biomolecule is a protein.
3. A solder according to claim 2 wherein the protein is any one or more of albumin, elastin, collagen and fibrinogen.
- Sub A2
- 10 4. A solder according to any one of the preceding claims, further comprising a dye for improving energy deposition into the solder when the solder is exposed to energy.
5. A solder according to claim 4 wherein the dye is indocyanine green, methylene blue or fluorescent isothiocyanate.
- 15 6. A solder according to any one of the preceding claims, further comprising an adjuvant for promoting rapid or more complete tissue healing.
- Sub A3
- 20 7. A solder according to claim 6 wherein the adjuvant is a growth factor, sodium hyaluronate, a hormone or an anti-coagulant.
8. A solder according to any one of the preceding claims, further comprising a material for improving the
- 25 strength of the solder.
9. A solder according to claim 8 wherein the material is a polytetrafluoroethylene fibre or a ceramic fibre.
10. A kit comprising a solder according to any one
- 30 of the preceding claims.
- Sub A4
11. A method of preparing a biomolecular solder, the method comprising the following steps:
- 35 (a) forming a substantially solid composition comprising biomolecules and a solvent;
- (b) denaturing the biomolecules in the composition, and

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(c) drying the composition to form the solder;  
wherein in step (b), the biomolecules are denatured so  
that in use, the solubility of the solder is reduced.

Sub A4  
Sub B5  
12. A method according to claim 11 wherein in step  
5 (b) the biomolecules are denatured by exposing the  
composition to energy for a time period which is  
sufficient to allow the energy to denature the  
biomolecules.

13. A method according to claim 12 wherein the  
10 energy is thermal energy.

Sub B6  
14. A method according to claim 13 wherein the  
biomolecules are denatured by heating the composition at a  
temperature of greater than 40°C for a time period of about  
30 seconds or longer.

Sub A5  
15. A method according to claim 14 wherein the  
composition is heated in a hot liquid bath or in  
pressurised steam.

Sub B8  
16. A method according to claim 11 wherein in step  
20 (b), the biomolecules are denatured by exposing the  
composition to a compound for a time period which is  
sufficient to allow the compound to denature the  
biomolecules.

17. A method according to claim 11 wherein in step  
25 (a), the substantially solid composition is formed by  
mixing the biomolecules with a solvent in amounts which  
are sufficient to allow the substantially solid  
composition to form.

Sub A6  
18. A method according to claim 17 wherein the  
biomolecules and the solvent are mixed in amounts of  
30 80%w/w and 20%w/w respectively.

19. A method according to claim 11 wherein in step  
(a), a dye for improving energy deposition into the solder  
is added to the substantially solid composition.

Sub B10  
20. A method according to claim 19 wherein the dye  
35 is added to the composition in an amount between 0.1 to  
2.5% w/w.

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21. A method according to claim 20 wherein the dye is mixed with the solvent, prior to mixing the solvent with the biomolecules.

22. A method according to claim 11 wherein in step 5 (c), drying the composition to form the solder removes all of the solvent from the solder.

23. A method according to claim 11 wherein the composition is formed into a shape before the biomolecules in the composition are denatured in step (b).

10 Sub B12 24. A method according to claim 23 wherein the composition is applied to a structure before the biomolecules in the composition are denatured in step (b).

25. A method according to claim 24 wherein the structure is a mesh, stiffener or graft material.

13 Sub B14 26. A method according to claim 11 further comprising the step of sterilizing the solder.

27. A method of repairing a biological tissue, the method comprising the following steps:

20 (a) applying a solder according to claim 1 to the site of a tissue to be repaired; and

(b) exposing the solder to energy for a time sufficient to allow the solder to bond to the tissue so that the tissue is repaired.

28. A method according to claim 27 wherein the 25 solder is moistened before application to the site of the tissue to be repaired.

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